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with straight lines, with the exception of the curve at its extreme end. The line of projection shown by the angle A B and the intersecting members are given on Fig. 2 in the same plate. These lines when raised to position will stand directly over those of the plan, so that members of both are seen to range exactly with each other.

It will be noticed that the member on Fig. 2, marked D, is much wider than the corresponding member, J, on the plan Fig. 1. This teaches a lesson which may be of great service in many ways to the student who thoroughly masters the problem; to some workmen this simple solution may seem a small matter, but to those who think and who understand its application it will be found to be a matter of great importance in constructive art.

By a proper application of the foregoing problem, many works that appear difficult of execution and complicated in their nature may often be reduced to such a stage of simplicity that any ordinary mechanic will be able to understand them without effort.

If the student will draw this figure on a piece of cardboard, then cut the cardboard through on the lines marked *xxxx*, and fold it over on the lines marked *ooo*, laying the point C on the point A, he will have at once a practical application of the rule, and he will understand without further explanation the great utility of the problem.

The spaces marked *s s* are cut out to give a better idea of the working of the rule.

Correspondence.

WE invite communications from our readers in matters connected with the trades we represent. Be brief, courteous, and to the point.

Editor of the Wood-Worker :

I SEND you the following method, which I think is new, for obtaining the stretchout of a circle : Set your compasses at A, Fig. 9, Plate 43 ; draw one half of a circle ; draw the base line B L, and the perpendicular line A B. Set your compasses at B, and describe the circle C ; put your right angle on the semicircle at B and C ; then intersect the base line at A, and from D to E you have the length of the stretchout of one fourth of the circle.

G. H. VAN PATTEN.

IOWA CITY, IOWA.

Editor of the Illustrated Wood-Worker :

THE following is a method of describing an oval, which I am sure will prove useful to many of your readers : Draw P K, Fig. 9, Plate 43, equal to intended length of oval ; bisect P K by *c i* at right angles, making O L and O H each equal to half the breadth of oval ; then describe quarter-circle *g J H* with O as

a centre ; make *g J* one third of quarter-circle, and draw O J *m* ; on O as centre, with *o P* as radius, strike arc intersecting at *m* ; draw J *n* parallel to P K and *m n* to C H : now *n* will be a true point for a mathematical curve. On *n* and H make intersections as shown, through which draw dotted lines cutting L H at *c*, which is one centre. Take radius *c H* and set it from P to *f* ; then on *f* and *c* make intersecting arcs through which find centre *e* ; draw *c e* produced towards *n*, thus determining the limits of the arcs comprising one quarter of the oval.

W. H. C.

ORILLIA, ONT., May 16, 1879.

Editor of the Wood-Worker :

IN the May number of the WOOD-WORKER, Plate 39, I find it easy to understand all the lines in projection without referring to the explanations, with the exception of the elliptical curve, for which no rule to obtain is given on the plate. Will Mr. Riddell or some of your advanced readers explain how the two foci for the ellipse are found ?

S. P.

FULTON, N. Y., May 12, 1879.

[S. P. will find the ellipse and some of its qualities fully described in the March number of the WOOD-WORKER.—ED.]

Editor of Wood-Worker :

I FORWARD you a drawing of a carpenter's gauge-head (shown on Plate 43, Fig. 10) which requires no thumb-screw, wedge, or other fastening, only requiring to be turned off the centre slightly to be made fast on the gauge stem. This will be new to many of your readers. It can be readily understood from the drawing, and any carpenter can make a pair of gauges for himself in this style in less than an hour.

I also forward a simple method, though not a new one, for obtaining an octagon. The drawing (Fig. 12, Plate 43) explains itself.

F. W. H.

ST. LOUIS, MO., April 27, 1879.

Work and Pleasure.

IT is not uncommon for those who have much work to do to complain that they have little or no time for enjoyment. This is especially true of the young. The very name of play or pleasure has a magical transforming power. That name makes toilsome pastime a delight ; while the idea of work often makes the easiest task seem oppressive. It is not to be denied that there is wisdom in proper recreation and diversion for the laborer. They are necessary to keep up the

spirits and maintain somewhat of the charm of freshness in one's occupation, whatever it may be. It is well, now and then, to "lay down the shovel and the hoe," and turn the mind away to the quiet scenes of the home, and to the exhilarating pleasures of a holiday.

But very unfortunate are they—young or old—whose real enjoyment is limited to those rare occasions when work is for a while relinquished, and so-called pleasure is sought in extraordinary ways. Now we are so constituted that, under the law of habit and the peculiar effect of conscious usefulness and promising engagements, we may come to love our work, and find in its legitimate prosecution the very essence of contentment, hope and joy. To work with the right purpose and in the right way, is to convert work into pleasure. What a fortune is possessed by the man that has attained to that desirable experience: His work-days are more than holidays; for they add to the pleasure of the common holidays the cheering assurance of gain and progress.

Intercommunication.

THIS department is intended to furnish, for the benefit of all our readers, practical information regarding the art of manipulating wood by hand or machinery; and we trust that every reader of our paper will make the fullest use of it, both in asking and answering. All persons possessing additional or more correct information than that which is given relating to the queries published, are cordially invited to forward it to us for publication. All questions will be numbered, and in replying it will be absolutely necessary, in order to secure due insertion, that the NUMBER and TITLE of the question answered should be given; and in sending questions, the title of key-words of the question should be placed at the head of the paper. Correspondents should in all cases send their addresses, not necessarily for publication, but for future reference. We also request that all questions or answers be written on separate slips of paper, and addressed to the Editor. Notes of practical interest will be welcome at all times. When drawings are sent to illustrate answers to questions, or for full pages, they should be on separate slips, and should be drawn in ink on clean, white paper. Short questions, requiring short answers, may be asked and answered through the agency of postal cards.

When answers to questions are wanted by mail, the querist must send a stamp for return postage.

Queries.

35. **PLOUGH.**—I shall be obliged to any of my fellow readers who will be kind enough to inform me where I can procure one of Phillip's Plough Planes.—JOHN R. D.

36. **SAWS.**—Can you or any of your readers tell me how to fasten emery on a wooden wheel, so that I can use it for gumming saws? Information on this subject will be appreciated by—MANDRIL.

37. **OAK.**—If some of your gifted subscribers would give me the specific gravity and strength of domestic and imported oak, they would confer a favor on an old BACKWOODSMAN.

38. **FLUTE.**—How can I color the ivory

joint of a flute black, without injuring the tone of the instrument?—CLEFF.

39. **CUPBOARD.**—I am well pleased with the design of bookcase and writing-desk shown on Plate 37, in the May number of the *WOODWORKER*, and would like very much if the designer, Mr. George Woodcock, would furnish you for publication, a design for a kitchen cupboard for a large farmhouse where there are nine persons in the family.—AMATEUR.

40. **BOOKS.**—I am now an apprentice to a builder, and will end my service as such on the last day of the present year; I have received a fair common school education and am pretty well advanced in figures and geometry, I am no draftsman, but wish to become one, and also have a desire to acquire a passable knowledge of constructive architecture. I have about sixty dollars at my command, and wish to invest it in books such as will be of the most service to me. Now I will take it as a great favor, if some of your experienced readers will publish a list, in this department of your valuable paper, of such books as would suit a person in my position who desires to become a builder and contractor.—AMBITIOUS.

41. **COMMUNION TABLE.**—I have built a small Gothic church (Episcopal), in a country village, and wish to make a communion table for it, not too large or elaborate. Would some kind reader publish a design of a table, such as would be suitable for the church mentioned? I would like it to be in oak, with chamfers black.—CLERICUS.

42. **NAILS.**—I have somewhere seen an account where the adhesive force of nails and screws was given. Can you or any of your readers tell me where I can find the account, or give me a synopsis of the results of experiments made with nails and screws in different kinds of wood.—ANXIOUS.

Answers.

WE wish it distinctly understood, that we do not hold ourselves responsible for the accuracy or reliability of answers furnished to this department by our correspondents.

We cordially invite our readers to take an active part in this department, as we are confident that much good can be accomplished by a free interchange of ideas and opinions in regard to subjects connected with the art of wood-working.

Many persons are afraid to write to a public journal because of their lack of literary attainments; to such we would say: Give us your ideas in such language as you can command, and leave the rest to us. It is ideas and opinions we want, such as may be of use to the workman or amateur. Answers should be sent to this office on or before the fifteenth of each month, to insure insertion in the next issue.

14. **MACHINE CUTTERS.**—B. G. can find the shape of his cutters, by proceeding as follows: Let A B C D, Fig. 7, Plate 43, represent the cutter head, F its centre; from F through A draw F A J, indefinitely. Make